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# Implementation Plan Review for Mississippi Required by the Energy Supply & Environmental Coordination Act

Environmental Protection Agency, Research Triangle Park, N C

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Argonne National Lab, Ill Energy and Environmental Systems Div

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# IMPLEMENTATION PLAN REVIEW

# FOR

# MISSISSIPPI

## AS REQUIRED

## BY

## THE ENERGY SUPPLY

## AND

## ENVIRONMENTAL COORDINATION ACT

U. S. ENVIRONMENTAL PROTECTION AGENCY

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Section IV of the Energy Supply and Environmental Coordination Act of 1974, (ESECA) requires EPA to review each State Implementation Plan (SIP) to determine if revisions can be made to control regulations for stationary fuel combustion sources without interferring with the attainment and maintenance of the national ambient air quality standards. This document, which is also required by Section IV of ESECA, is EPA's report to the State indicating where regulations might be revised.

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# IMPLEMENTATION PLAN REVIEW

# FOR

# MISSISSIPPI

# REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

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February 1975

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IMPLEMENTATION PLAN REVIEW

FOR

MISSISSIPPI

REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

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IMPLEMENTATION PLAN REVIEW

FOR

THE STATE OF MISSISSIPPI

REQUIRED BY THE ENERGY SUPPLY AND ENVIRONMENTAL COORDINATION ACT

## 1.0 EXECUTIVE SUMMARY

The enclosed report is the U.S. Environmental Protection Agency's (EPA's) response to Section IV of the Energy Supply and Environmental Coordination Act of 1974 (ESECA). Section IV requires EPA to review each State Implementation Plan (SIP) to determine if control regulations for stationary fuel combustion can be revised without interfering with the attainment and maintenance of the National Ambient Air Quality Standards (NAAQS). In addition to requiring that EPA advise the state as to whether control regulations can be revised, ESECA provides that EPA must approve or disapprove any revised regulations relating to fuel burning stationary sources within three months after they are submitted to EPA by the states. The states may, as under the Clean Air Act of 1970, initiate State Implementation Plan revisions; ESECA does not, however, require states to change any existing plan.

Congress has intended that this report provide the state with information on excessively restrictive control regulations. The intent of ESECA is that SIPs, wherever possible, be revised in the interest of conserving low-sulfur fuels or converting to coal, sources which burn oil or natural gas. EPA's objective in carrying out the SIP reviews, therefore, has been to try to determine if emissions from certain combustion sources may be increased without interfering with the attainment and maintenance of standards. If so, it may be possible through altered resource allocations to effect significant "clean fuel savings" in a manner consistent with both environmental and national energy needs.

In many respects, the ESECA SIP reviews parallel the implementation of EPA's policy on clean fuels. Under the Clean Fuels Policy, implementation plans have been reviewed with a view to saving low sulfur fuels. Where the primary sulfur dioxide air quality standards will not be exceeded, states have been encouraged to either defer attainment of secondary standards or to revise the $SO_2$ emission regulations. The states have also been asked to discourage large-scale shifts from coal to oil where this could be done without jeopardizing the attainment and maintenance of the NAAQS.

To date, this activity has involved only those states with the largest clean fuels savings potentials. Several of these states have revised or are currently in the process of revising their $SO_2$ regulations. These states are generally in the eastern half of the United States. ESECA, however, requires the analysis of potentially over-restrictive regulations in all 55 states and territories. In addition, the current reviews address the attainment and maintenance of all the National Ambient Air Quality Standards.

The adoption of emission limitations which may, in some areas of the states, be overly restrictive (or not restrictive enough) resulted largely from the use of the "example region" approach along with analyses which considered the "hot spots" of an Air Quality Control Region (AQCR) rather than the entire region. This type of approach was offered in EPA guidelines for plan development when states were preparing their original plans. Many states, through concurrence with EPA, adopted the example region approach, largely because of the short timetable dictated by the Clean Air Act. Also, in most cases, the original SIPs were designed to attain and maintain the original NAAQS, some of which have since been designated as "guides" only or actually rescinded. However, many states adopted and retained the original federal standards or, in a few cases, adopted more restrictive state standards, and these served as the bases on which their SIPs were approved. As a result, the requirements of many state plans conflict with legitimate national energy concerns, and thus a review of the State Implementation Plans is a logical follow-up to EPA's initial appraisal (1972) of the SIPs. At the time, SIPs were approved by EPA if they demonstrated the attainment of the original NAAQS or the more stringent state air quality standards. Also, at that time an acceptable method for formulating control strategies was the use of an example region for demonstrating the attainment of the standards.

The example region concept permitted a state to identify the most polluted air quality control region and adopt control regulations which would be adequate to attain the NAAQS in that region. In using an example region, it was assumed that NAAQS would be attained in the other AQCRs of the state if the control regulations were applied to similar sources. But use of an example region can result in excessive controls, especially in the utilization of clean fuels, for areas of the state where sources would not

otherwise contribute to NAAQS violations. For example, a control strategy based on a particular region or source can result in a regulation requiring 1 percent sulfur oil to be burned statewide, even though the use of 3 percent sulfur coal would be adequate to attain NAAQS in some locations.

EPA anticipates that a number of states will use the review findings to assist them in deciding whether or not to revise portions of their State Implementation Plans. However, it is most important for such states to recognize the limitations of the present review. The findings of this report are by no means conclusive and are neither intended nor adequate to be the sole basis for SIP revisions; they do, however, represent EPA's best judgment and effort in complying with the ESECA requirements. The time and resources which EPA has had to prepare the reports has not permitted the consideration of growth, economics, and control strategy tradeoffs. Also, there has been only limited dispersion modeling data available by which to address individual point source emissions. Where the modeling data for specific sources was found, however, it was used in the analysis.

The data upon which the reports' findings are based is the most currently available to the federal government. However, EPA believes that the states possess the best information for developing revised plans. The states have the most up-to-date air quality and emissions data, a better feel for growth, and the fullest understanding for the complex problems facing them in the attainment and maintenance of air quality. Therefore, those states desiring to revise a plan are encouraged to verify and, in many instances, expand the modeling and monitoring data used to support EPA's findings. States are encouraged to consider the overall impact which the potential relaxation of overly restrictive emissions regulations for combustion sources might have on their future control programs. This may include air quality maintenance, prevention of significant deterioration, increased TSP, $NO_x$, and HC emissions which occur in fuel switching, and other potential air pollution situations.

Although the enclosed analysis has attempted to address the attainment of all the NAAQS, most of the review has focused on total suspended particulate matter (TSP) and sulfur dioxide ($SO_2$) emissions. This is because stationary fuel combustion sources constitute the greatest source of $SO_2$ emissions and are a major source of TSP emissions.

The following are the principle findings for the State of Mississippi. (Air Quality Control Regions are displayed on Figure 1-1.)

- The state has adopted the secondary federal National Ambient Air Quality Standards for particulates and the original federal secondary standards for $SO_2$. EPA has rescinded the annual and 24-hr secondary $SO_2$ standards, but equivalent standards are still applicable in Mississippi, making the state's $SO_2$ standards more stringent than the federal NAAQS. Attainment of the state $SO_2$ standards would require stricter emission controls than would attainment of the federal NAAQS only.

- The statewide regulations for particulates and $SO_2$ are based on the example region approach. Mississippi has not initiated any changes in its $SO_2$ regulations under EPA's Clean Fuels Policy.

- Within the framework of this limited analysis there appears to be little margin for relaxed particulate emission regulations. Each region is either experiencing high particulate levels or has little clean fuels savings that would result from regulation revision.

- For $SO_2$ there are indications of a significant tolerance for increased $SO_2$ emissions in the Metropolitan Memphis AQCR (#18), the Mississippi Delta AQCR (#134), and the Northeast Mississippi AQCR (#135) but no annual average air quality data were available. In the Mobile-Pensacola-Panama City-Southern Mississippi AQCR (#5) there are indications that no overall increase in $SO_2$ emissions is tolerable.

- The present Mississippi regulations allow the firing of high sulfur coal and oil (more than three percent sulfur). Hence, even in those regions where there are indications that increased $SO_2$ emissions might be tolerable, the utilization of high sulfur fuels and the consequent saving of clean fuels would not require a revision in the regulations.

- There may be specific sources in Mississippi precluded from using high sulfur fuel by that provision of the regulation which places a ceiling on total sulfur emissions in any year equal to that emitted by the source in 1970. However, the Air and Water Pollution Control Commission can grant a variance from this provision and thus need not keep any source restricted to low sulfur fuels.

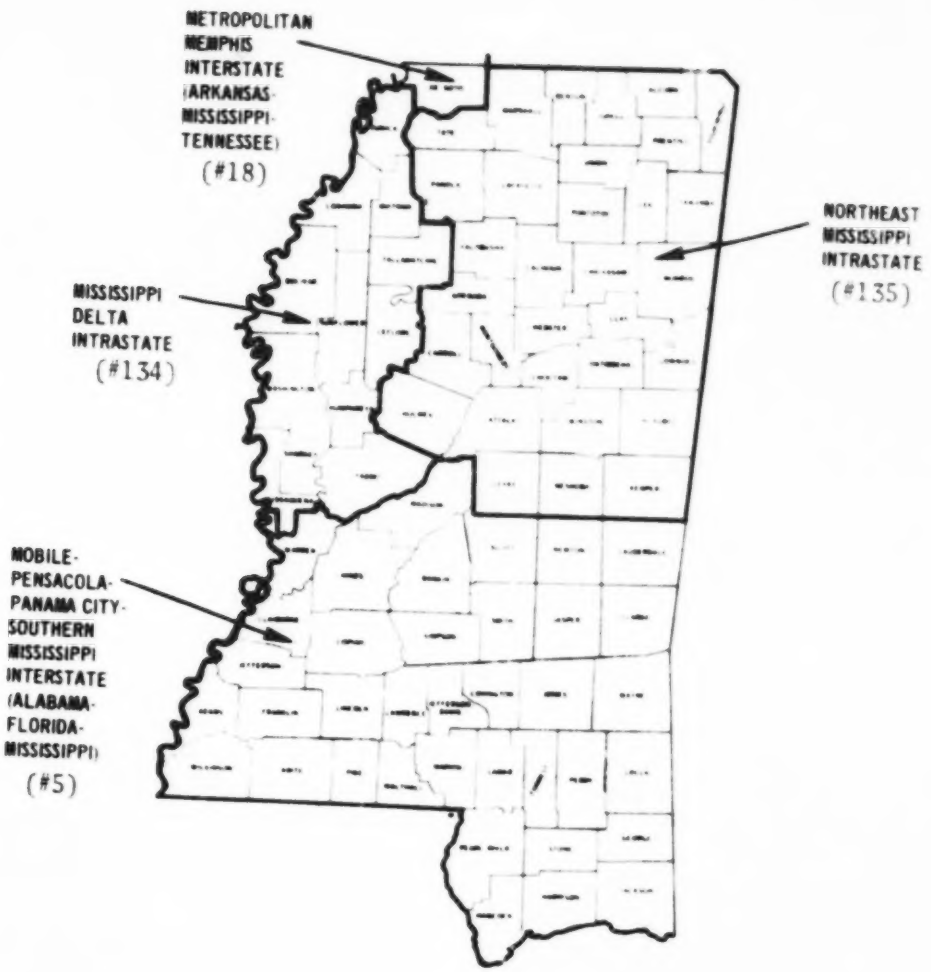


Figure 1-1. Mississippi Air Quality Control Regions (AQCR)

# 2.0 MISSISSIPPI STATE IMPLEMENTATION PLAN REVIEW

## 2.1 Summary

A revision of fuel combustion source emissions regulations will depend on many factors. For example:

- Does the state have air quality standards which are more stringent than NAAQS?
- Does the state have emission limitation regulations for control of (1) power plants, (2) industrial sources, (3) area sources?
- Did the state use an example region approach for demonstrating the attainment of NAAQS or more stringent state standards?
- Has the state initiated action to modify combustion source emission regulations for fuel savings; i.e., under the Clean Fuels Policy?
- Are there proposed Air Quality Maintenance Areas?
- Are there indications of a sufficient number of monitoring sites within a region?
- Is there an expected 1975 attainment date for NAAQS?
- Based on (1973) air quality data, are there reported violations of NAAQS?
- Based on (1973) air quality data, are there indications of a tolerance for increasing emissions?
- Are the total emissions from stationary fuel combustion sources a relatively small portion of the regional total?
- Do modeling results for specific fuel combustion sources show a potential for a regulation revision?
- Is there a significant clean fuels savings potential in the region?
- Must the regulations be revised to accomplish significant fuels switching?

This SIP review has answered these questions based on an overall evaluation of EPA's current information. Based on these answers, each AQCR has been assessed as a good, marginal, or poor candidate for regulation relaxation. Table 2-1 summarizes the conclusions of this State Implementation Plan Review and gives the overall candidacy assessment for each AQCR.

Table 2-1. State Implementation Plan Review for Mississippi

| "INDICATORS" | State | | Mobile-Pensacola-Panama City-Southern Mississippi[a] AQCR #5 | | Metropolitan Memphis[a] AQCR #18 | | Mississippi Delta AQCR #131 | | Mississippi AQCR #135 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | TSP | $SO_2$ | TSP | $SO_2$ | TSP | $SO_2$ | TSP | $SO_2$ | TSP | $SO_2$ |
| • Does the State have air quality standards which are more stringent than NAAQS? | NO | YES | | | | | | | | |
| • Does the State have emission limiting regulations for control of:<br>1. Power plants<br>2. Industrial sources<br>3. Area sources | YES<br>YES<br>YES | YES<br>YES<br>YES | | | | | | | | |
| • Did the State use an example region approach for demonstrating the attainment of NAAQS or more stringent State standards? | YES | YES | Example Region | | | | | | | |
| • Has the State initiated action to modify combustion source emission regulations for fuel savings; i.e., with the Clean Fuels Policy? | NO | NO | | | | | | | | |
| • Are there proposed Air Quality Maintenance Areas? | | | NO | NO | NO | NO | NO | NO | NO | NO |
| • Are there indications of a sufficient number of monitoring sites within a region? | | | YES | YES | YES | YES | YES | NO | YES | NO |
| • Is there an expected 1975 attainment date for NAAQS? | | | YES | YES | YES | YES | YES | YES[c] | YES | YES |
| • Do 1974 (1975) Air Quality Data, are there reported violations of NAAQS? | | | YES | YES | YES | NO[b] | NO[b] | NA | NO[b] | NO[b] |
| • Based on 1974 Air Quality Data, are there indications of a significant tolerance for increasing emissions? | | | NO | NO | NO | YES | NO | NA | YES | YES |
| • Are the emissions from stationary fuel combustion sources a relatively small portion of the regional total? | | | YES | YES | YES | YES | YES | YES | YES | NO |
| • Do modeling results for specific fuel combustion sources show a potential for a regulation revision? | | | NA | NO | NA | NA | NA | NA | NA | NA |
| • Is there a significant Clean Fuels Saving potential in the region? | | | NO | | NO | | NO | | NO | |
| • Must the regulations be revised to accomplish significant fuel switching? | | | NO | | NO | | NO | | NO | |
| • Based on the above indicators, what is the potential for revising fuel combustion source emission limiting regulations? | | | TSP - Poor<br>$SO_2$ - Poor | | TSP - Poor<br>$SO_2$ - Poor | | TSP - Poor<br>$SO_2$ - Poor | | TSP - Poor<br>$SO_2$ - Poor | |

[a]Interstate

[b]No annual data

[c]Attainment schedule indicates region is below standards; current data is unavailable

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## 2.2 Air Quality Setting for the State of Mississippi

### 2.2.1 Mississippi Air Quality Control Regions

The State of Mississippi is divided into four Air Quality Control Regions as shown in Figure 1-1 and Table 2-2. There are two intrastate and two interstate regions. Only the Metropolitan Memphis Interstate AQCR (#18) has a relatively large (greater than 75 people per square mile) population density. Based on present conditions and growth projections for the state, no counties in Mississippi have been proposed as Air Quality Maintenance Areas (AQMAs) for either particulates or sulfur dioxide.

### 2.2.2 Mississippi Ambient Air Quality Standards

All the federal primary and secondary National Ambient Air Quality Standards (NAAQS) for particulates, sulfur dioxide, and nitrogen dioxide apply in Mississippi. In addition the state retains annual and 24-hour sulfur dioxide standards equivalent to old federal secondary sulfur dioxide standards which have been rescinded by EPA. These state sulfur dioxide standards are more stringent than present federal primary standards. Mississippi air quality standards are summarized in Table 2-3. This review considers only the attainment of the federal NAAQS.

### 2.2.3 Mississippi Air Quality Status

Based on data in the SAROAD data banks as of June, 1974, both the annual and 24-hour particulate NAAQS are being violated in Mobile-Pensacola-Panama City-Southern Mississippi (#5) and Metropolitan Memphis (#18) AQCRs. Annual average data is unavailable for the Mississippi Delta (#134) and Northeast Mississippi (#135) AQCRs. No 24-hour violations have been reported in these latter two regions but the Mississippi Delta is just meeting the standards. Thus, with the possible exception of Northeast Mississippi (#135) the indications are that relaxation of particulate regulations would not be possible without disrupting NAAQS attainment or maintenance.

$SO_2$ air quality data was unavailable from the Mississippi Delta AQCR (#134) and no annual data was available from Metropolitan Memphis (#18) or from Northeast Mississippi (#135). For the latter two regions, there were indications that $SO_2$ emission regulations could be relaxed without jeopardizing attainment

Table 2-2. Mississippi Air Pollution Control Areas

| Air Quality Control Region | Federal Number | Demographic Information: 1970 Population (Millions) | Area (thousand sq. mile) | Population Density (people per sq. mile) | Priority Classification: Particulates | $SO_2$ | $NO_2$ | Proposed AQMA Designations[a]: TSP Counties | $SO_2$ Counties |
|---|---|---|---|---|---|---|---|---|---|
| Mobile-Pensacola-Panama City-Southern Mississippi (Ala., Fla.) | 5 | 2.1 | 33.6 | 63 | I | I | III | (0) | (0) |
| Metropolitan Memphis (Ark., Tenn.) | 18 | 0.8 | 1.8 | 439 | I | III | III | (0) | (0) |
| Mississippi Delta | 134 | 0.3 | 7.2 | 47 | III | III | III | (0) | (0) |
| Northeast Mississippi | 135 | 0.6 | 17.3 | 37 | II | III | III | (0) | (0) |

[a]As of November 26, 1974

Table 2-3. Mississippi Ambient Air Quality Standards
All concentrations in μgm/m³

| | | Total Suspended Particulate | | Sulfur Dioxide | | | Nitrogen Dioxide |
|---|---|---|---|---|---|---|---|
| | | Annual | 24-Hr | Annual | 24-Hr | 3-Hr | Annual |
| State and Federal | Primary | 75(G) | 260[a] | 80(A) | 365[a] | --- | 100(A) |
| | Secondary | 60(G) | 150[a] | --- | --- | 1300[a] | 100(A) |
| State | | 60(G) | 150 | 60(A)[b] | 260[a,b] | 1300[a] | 100(A) |

[a]Not to be exceeded more than once a year.

[b]Was adopted based on original EPA policy which was rescinded July, 1973.

(A) Arithmetic mean.

(G) Geometric mean.

and maintenance of the NAAQS. In the Mobile-Pensacola-Panama City-Southern Mississippi AQCR (#5), one station was apparently violating the 24-hour $SO_2$ NAAQS and hence there is little tolerance for increased $SO_2$ emissions in that region.

### 2.2.4 Mississippi Emissions Summary

In the four AQCR area, Mississippi fuel combustion sources account for less than 10% of the total particulate and $SO_2$ emissions. There are no power plants in the Mississippi portion of the Metropolitan Memphis AQCR (#18) nor in the Northeast Mississippi AQCR (#135). No significant industrial/commercial/institutional point sources are located in the Mississippi portion of the Metropolitan Memphis AQCR (#18) nor in the Mississippi Delta AQCR (#134).

The largest fraction of particulate emissions from fuel burning in Mississippi comes from industrial/commercial/institutional point sources in the Mobile-Pensacola-Panama City-Southern Mississippi AQCR (#5) and from area sources in the Metropolitan Memphis AQCR (#18). Industrial/commercial/institutional point sources and area sources emit about the same fraction of particulates from fuel combustion in both the Mississippi Delta AQCR (#134) and the Northeast Mississippi Delta AQCR (#135).

The largest fraction of $SO_2$ emissions from fuel combustion in Mississippi comes from industrial/commercial/institutional point sources in the Mobile-Pensacola-Panama City-Southern Mississippi AQCR (#5) where emissions from electricity generation are also significant. Area sources contribute the largest fraction of $SO_2$ emissions from Mississippi fuel combustion in Metropolitan Memphis (#18) and Northeast Mississippi (#135) and electricity generation the largest fraction in Mississippi Delta (#134).

### 2.2.5 Power Plant Modeling

A summary of the limited modeling data available for Mississippi is shown on Table 2-4. It is evident that existing regulations are already allowing high sulfur fuel to be used where it is available and there is no indication of any clean fuels saving to be gained by regulation revision.

Table 2-4. Mississippi Power Plant Evaluation Summary

$SO_2$

| AQCR | Fuel | 1975 Fuel Required by SIP Regulations[a] < 1% | 1-2% | 2-3% | >3% | 1975 Fuel Required by Modified Regulations[b] 1% | 1-2% | 2-3% | >3% |
|---|---|---|---|---|---|---|---|---|---|
| 5[c] | Coal | | | | | | | | |
| | Oil | 24,312[d] | 1,001 | 1,943 5,796 | 6,851 | 24,312[e] | 1,001 | 1,943 5,796 | 6,851 |
| | Gas | 89,785[d] | | | | | | | |
| 18[c] | NO PLANTS | | | | | | | | |
| 134 | Coal | | | | | | | | |
| | Oil | | | 6 | | No modeling results available. | | | |
| | Gas | 34,593 | | 336 | 38,405 | | | | |
| 135 | NO PLANTS | | | | | | | | |
| Mississippi Total | Coal | | | | | | | | |
| | Oil | 24,312 | 1,001 | 1,949 6,132 | 45,256 | 24,312[f] | 1,001[f] | 1,943[f] 5,796[f] | 6,851[f] |
| | Gas | 124,378 | | | | 89,785 | | | |

[a]Fuel requirements based on 1971 fuel use patterns at 1975 consumption rates plus any new units. If 1971 fuel use data were unavailable, 1972 data were used. Maximum % S is 1971 % S unless regulations require a lower % S. All plants for which actual % S data were available were already meeting SIP requirements. Coal in $10^3$ tons/yr, oil in $10^3$ gal/yr, gas in $10^6$ $ft^3$/yr.

[b]Maximum allowable % S is 1971 % S unless modeling results indicate a lower value. All plants for which actual % S data were available were already meeting SIP requirements. Data from Modeling Analysis of Power Plants for Compliance Extensions in 51 Air Quality Control Regions, Walden Research Division of Alcor, Inc., December 17, 1973.

[c]Interstate.

[d]Includes LP gas and propane gas at Eaton plant.

[e]Modeling estimates made for coal only at Jack Watson plant. This figure assumes no change in % S oil from 1971 figure.

[f]Although modeling results are incomplete, these data give some indication of minimum clean fuels savings.

## 2.3 Background on the Development of the Current State Implementation Plan

### 2.3.1 General Information

The example region approach was used to develop the Mississippi State Implementation Plan. The proportional rollback model including background was used to demonstrate the effectiveness of the proposed particulate regulations in the Jackson City, Gulfport-Biloxi, and Moss Point-Pascagoula areas of the Mobile-Pensacola-Panama City-Southern Mississippi AQCR (#5). Growth projections were made through the 1975 attainment date and attainment of the secondary annual particulate NAAQS was demonstrated. However, the attainment of the 24-hour particulate standards was not addressed in the plan.

A dispersion model was used to demonstrate the effectiveness of the proposed $SO_2$ regulations. For fuel combustion sources, the most critical test was deemed to be the Jack Watson power plant in the Gulfport-Biloxi area. Taking a proposed new unit into account, the model predicted that all ambient standards would be met including the old federal annual and 24-hour secondary standards still applicable under state regulations.

### 2.3.2 Particulate Control Strategy

The control strategy for particulate emissions for fuel combustion sources consists of enforcement of Sections 3.1, 3.2, and 4 of Regulation APC—S-1, amended, of the Mississippi Air and Water Pollution Control Commission. The first two subsections deal with smoke and Section 4 limits mass emission rates and grain loadings. These standards were designed to meet the annual secondary NAAQS throughout Mississippi. They apply to area sources as well as large point sources. The pertinent portions of these regulations are summarized in Table 2-5 and Figure 2-1.

### 2.3.3 Sulfur Dioxide Control Strategy

Section 4.1 of Regulation APC—S-1 contains the $SO_2$ emissions limits whose enforcement constitutes the $SO_2$ control strategy. These limitations are summarized in Table 2-5. All sources, including area sources, are subject to the regulations which were designed to ensure attainment of all NAAQS for $SO_2$ throughout the state. In demonstrating the effectiveness of the regulations only the limit on mass emission rates was considered, not the possibly more restrictive yearly total emissions limitation.

Table 2-5. Mississippi Fuel Combustion Emission Regulations

| | Existing Sources | | New Sources | |
|---|---|---|---|---|
| | $\geq 250 \times 10^6$ Btu/hr and $< 250 \times 10^6$ Btu/hr (unmodified) | $< 250 \times 10^6$ Btu/hr (Modified) | $\leq 250 \times 10^6$ Btu/hr | $> 250 \times 10^6$ Btu/hr[a] |
| $SO_2$ | 4.8 lbs/$10^6$ Btu | 2.4 lbs/$10^6$ Btu | Same as for existing facilities. | .8 lbs/$10^6$ Btu for liquid fuel<br>1.2 lbs/$10^6$ Btu for solid fuel |
| | All sources are limited in any calendar year to the same or less emissions than the same source emitted in calendar 1970.[b] | | | |
| Particulates | Opacity of Ringelmann #2; greater opacity allowed for start-up for 15 minutes in any one hour with 3 startups per stack per day or for emergencies or breakdowns with no time limit; #3 permitted during soot-blowing provided that aggregate time of such emissions in any 24-hour period does not exceed 10 minutes per $10^9$ Btu gross heating value of fuel burned in any one hour.<br>Limit determined by Fig. 2-1. | | Same as for existing facilities. | Opacity of 20%; 40% allowed for 2 minutes in any one hour.<br>0.1 lbs/$10^6$ Btu |

[a] The Federal New Source Performance Standards apply in this case and these limits are not specifically included in the Mississippi regulation.

[b] The Commission can grant a variance from this limiting condition.

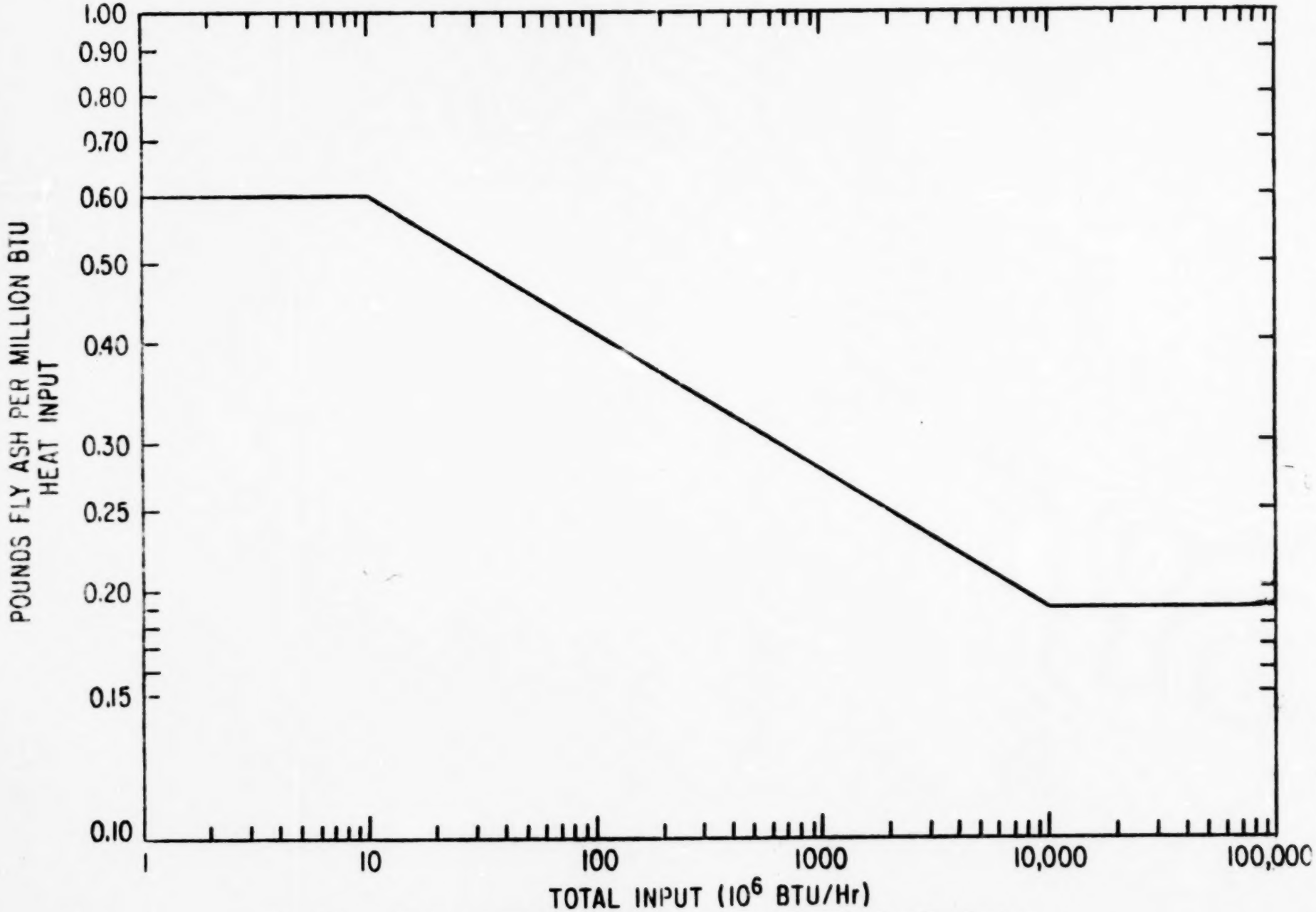


Figure 2-1. Maximum Permissible Emission of Fly Ash and Other Particulate Matter from Fuel Burning Installations in Mississippi.

## 2.4 Special Considerations for the State of Mississippi

### 2.4.1 Planned SIP Revisions

Mississippi is not presently considering changing its State Implementation Plan with respect to fuel combustion sources.

### 2.4.2 Fuels

Mississippi consumes very little coal. The Jack Watson power plant is the only major coal-fired power plant in the state. Almost 75% of the heat input for utility electric power is produced from oil and gas and over two-thirds is produced from gas. Industrial/commercial/institutional point sources and area sources are almost exclusively users of oil and gas.

### 2.4.3 Potential Fuel Conversions

The Federal Energy Administration has not identified any power plants in Mississippi as having the potential to convert from burning gas or oil to burning oil.